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ABSTRACT

Computer Assisted Instruction (CAI) is discussed briefly as it might apply to agricultural education in order to supplement both text and teacher. CAI format is shown in a typical tutorial program used to help students understand basic concepts of work, power, horsepower, and torque. The author points out other instructional uses of CAI, such as collection and treatment of data; sharing of programs with other teachers; teaching logic; testing to the maximum level of student ability; generation of exams, simulations, and games; and graphics. CAI's most important feature, the author contends, is the interaction--the provision of immediate, relevant feedback to the student. (CP)

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COMPUTER ASSISTED INSTRUCTION IN AGRICULTURAL EDUCATION

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Computer Assisted Instruction (CAI) is a very stimulating teaching technique we can use to get across our point in a given lesson. It should be used only as a supplement to the text and the teacher. Many of you have seen or used programmed learning materials. The format of CAI material can be compared to the format of programmed learning. However, CAI preparation on the computer can be a very enjoyable experience.

CAI is not computer managed instruction - where the computer gives test averages, keeps track of grades and gives evaluation. However, as we become more familiar with the computer, we will use it to take care of these necessities.

CAI is not computerized instruction where all the course work is done by the computer. The computer can be programmed to provide a personal touch by the person who prepares the material. But in most teaching situations CAI is used to supplement the text and the instructor.

In addition to those areas mentioned above, the computer has other instructional uses, such as: 1) collection and treatment of data, 2) calculations, 3) generation of exams, 4) simulations and games, 5) graphics, and 6) searching data files.

How you program will vary with your teaching style and goals. The most important aspect about it is the interaction or the immediate, relevant feedback to the student. It is this aspect which makes it stimulating.

CE020261

The following is an example of a tutorial program that I prepared to assist students in understanding the concepts of work, power, horsepower and torque:

AME 346

```
  10   REM TUTORIAL PROGRAM ON POWER
  15   REM  AG POWER MACHINERY -- AME 346
  20   REM program started 3/22/79
  25   REM program revised 4/5/79
  29   REM C=no. correct in each area. change to 0 at beginning of each area.
  30   PRINT "WHAT IS YOUR NAME, PLEASE":
  35   INPUT A$
  40   PRINT
  45   PRINT A$", THIS PROGRAM GIVES YOU SOME PRACTICE IN POWER PROBLEMS"
  50   PRINT "EACH AREA WILL BE IDENTIFIED BY THE NUMBER IN FRONT OF EACH AREA."
  55   PRINT
  60   PRINT "    1-WORK"
  65   PRINT "    2-POWER"
  70   PRINT "    3-TORQUE"
  75   PRINT "    4-DRAWBAR HORSEPOWER"
  80   PRINT "    5-SHAFT HORSEPOWER"
  85   PRINT
  90   PRINT A$", IN WHICH AREA WOULD YOU LIKE TO WORK?"
  91   PRINT
  95   PRINT "TYPE THE NUMBER OF THE AREA FROM ABOVE WHEN I SHOW YOU A '?'"
  96   PRINT "TYPE IN '6' IF YOU DO NOT WANT TO WORK IN ANY AREA"
  97   PRINT "PRESS THE 'ATTN' KEY ON THE RIGHT AFTER YOU TYPE IN SOMETHING."
  98   PRINT
 100   INPUT N
 105   PRINT
 109   IF N=6 GOTO 3000
 110   ON N GOTO 199,699,1199,1699,2199
 111   PRINT
 115   PRINT "TYPE IN '1', '2', '3', '4', '5', OR '6'"
 116   GOTO 100
 199   C = 0
 200   PRINT "1.  IF A FORCE OF 100 LB MOVES THROUGH A DISTANCE OF 12"
 202   PRINT "    FT, THE FOOT LBS OF WORK DONE WOULD BE:"
 205   PRINT
 208   PRINT "       1)12   2)120   3)1200   4)12,000"
 210   L=3
 215   INPUT N
 220   PRINT
 225   IF N=L GOTO 283
 235   PRINT "SORRY ABOUT THAT! TRY AGAIN.  HINT- (W) = (D) X (F)"
 236   PRINT
 240   INPUT N
 250   W=W+1
 255   IF N=L GOTO 285
```

```
260   PRINT A$", SUBSTITUTE THE NUMBERS IN THE FORMULA"
265   INPUT N
266   IF N=L GOTO 285
270   PRINT "     100(F)   X   12(D)  =  1200(W), IS THE CORRECT PROCEDURE."
275   PRINT
280   PRINT "LET'S TRY ANOTHER ONE."
281   GOTO 299
283   C=C+1
284   R=R+1
285   PRINT "THAT'S CORRECT!"A$
299   PRINT
300   PRINT "2.  FIND THE FT-LB OF WORK DONE WHEN A 2,000 LB WEIGHT IS"
301   PRINT "    RAISED VERTICALLY THROUGH A DISTANCE OF 20 FT:"
305   PRINT
308   PRINT "        1)40   2)400   3)4000   4)40,000"
310   L=4
315   INPUT N
320   PRINT
325   IF N=L GOTO 383
335   PRINT "DID YOU MULTIPLY RIGHT?  CHECK IT TO BE SURE!"
336   PRINT
340   INPUT N
350   W=W+1
355   IF N=L GOTO 385
360   PRINT A$", 2,000 LB TIMES 20 FT = 40,000 FT-LB."
361   PRINT
365   INPUT N
366   IF N=L GOTO 385
370   PRINT
380   PRINT "HERE'S YOUR THIRD ONE."
381   GOTO 399
383   C=C+1
384   R=R+1
385   PRINT A$", THAT'S GOOD!"
```

This is what the student sees on the computer screen or printout as he runs or receives tutorial assistance through the program.

```
 RUN

AME 346   11/19/79   MON 11:05

WHAT IS YOUR NAME, PLEASE?   JORDAN

JORDAN, THIS PROGRAM GIVES YOU SOME PRACTICE IN POWER PROBLEMS.
EACH AREA WILL BE IDENTIFIED BY THE NUMBER IN FRONT OF EACH AREA.

     1-WORK
     2-POWER
     3-TORQUE
     4-DRAWBAR HORSEPOWER
     5-SHAFT HORSEPOWER
```

```
JORDAN, IN WHICH AREA WOULD YOU LIKE TO WORK?

TYPE THE NUMBER OF THE AREA FROM ABOVE WHEN I SHOW YOU A '?'
TYPE IN '6' IF YOU DO NOT WANT TO WORK IN ANY AREA
PRESS THE 'ATTN' KEY ON THE RIGHT AFTER YOU TYPE IN SOMETHING.
? 1
1.  IF A FORCE OF 100 LB MOVES THROUGH A DISTANCE OF 12
    FT, THE FOOT LBS OF WORK DONE WOULD BE:
       1)12    2)120    3)1200    4)12,000
? 3
THAT'S CORRECT! JORDAN

2.  FIND THE FT-LB OF WORK DONE WHEN A 2,000 LB WEIGHT IS
    RAISED VERTICALLY THROUGH A DISTANCE OF 20 FT:
       1)40    2)400    3)4000    4)40,000
? 1
DID YOU MULTIPLY RIGHT?  CHECK IT TO BE SURE!
? 2
JORDAN, 2,000 LB TIMES 20 FT = 40,000 FT-LB.
? 3
HERE'S YOUR THIRD ONE.

3.  A LOADED WAGON THAT WEIGHS 10,000 LBS, REQUIRES 400 LBS OF
    FORCE TO PULL IT ALONG A HORIZONTAL SURFACE.  IF THE WAGON IS
    PULLED FOR 100 FT, CALCULATE THE FT-LBS OF WORK DONE:
       1)40,000    2)400,000    3)1,000,000    4)4,000,000
? 1
GOOD ENOUGH

4.  HOW MUCH WORK IS DONE WHEN A 60 LB BALE IS MOVED VERTICALLY 5 FT?
       1)NONE    2)300    3)3000    4)3660
? 2
EXCELLENT CHOICE! JORDAN
```

There are five problems under each category. When the student correctly completes three problems he is given the following choices:

```
2900   PRINT
2901   PRINT A$", YOU HAVE CORRECTLY COMPLETED THREE PROBLEMS IN THIS AREA."
2905   PRINT "YOU HAVE EARNED THE OPTION TO GO TO ANOTHER AREA.  TYPE 'YES'"
2910   PRINT "IF YOU ELECT TO EXERCISE THAT OPTION.  A 'NO'WILL ALLOW YOU TO"
```

```
2911    PRINT "CONTINUE IN THIS AREA.  TYPE 'STOP' IF YOU WOULD LIKE TO STOP
        AT THIS POINT"
2915    INPUT Z$
2920    IF Z$ = "YES" GOTO 90
2921    IF Z$ = "STOP" GOTO 3000
2925    RETURN
3000    PRINT "O.K., "A$", THAT'S THE END OF YOUR TUTORING PROGRAM."
3005    PRINT "LET'S SEE HOW WELL YOU DID."
3010    PRINT
3015    PRINT "YOU TRIED"W+R" QUESTIONS AND GOT"R" CORRECT FOR "R*100/(W+R)"%."
3020    PRINT
3025    PRINT "HAVE A GOOD DAY!", A$
3030    PRINT
3035    PRINT "TYPE - 'SIGN OFF'     DON'T FORGET TO TURN OFF YOUR TERMINAL."
3040    END
```

In an effort to further reduce test anxiety, the student is given an evaluation as follows:

```
O.K., JORDAN, THAT'S THE END OF YOUR TUTORING PROGRAM.
LET'S SEE HOW WELL YOU DID.

YOU TRIED 4 QUESTIONS AND GOT 3 CORRECT FOR 75%.

HAVE A GOOD DAY!     JORDAN

TYPE - 'SIGN OFF'    DON'T FORGET TO TURN OFF YOUR TERMINAL.

DONE
```

Values of Using the Computer

Motivates students
Teaches logic
Apply knowledge learned in classroom
Advance beyond the intended lesson
Test to the student's maximum ability
Preparing for and making-up tests
Practice for the slow learner
Long-term events studied in a short period
Simulate real life situations
Changing variable for management problems
Articulation of competencies from school to school
Programs can be shared among teachers
Programs can be modified to local situation
Users will appreciate the values of the computer

With the cost of home computers being less than $1000.00, the age of computers is definitely here. Once you as educators use the computer in

one course, you will broaden the educational experiences of your students further by increasing their exposure to the computer through most all of your courses.

All groups served by agricultural education have been, are and will continue to use computers more and more. Let us all dedicate ourselves to the last sentence of "The FFA Creed." ". . . I will exert an influence in my home and community which will stand solid for my part in that inspiring task."